1. Techniques used for estimating physical and retirement lives cannot be used to estimate economic lives.

Traditional methods of determining asset lives for depreciation purposes are not adequate for use in forward-looking cost models. Historically, models used to compute asset lives assumed that competition and technology would continue at its traditional pace. The new competitive environment undercuts that basic assumption.

2. The asset lives used in Hatfield 2.2.2 are based on traditional life estimation techniques.

Despite the fact that traditional methods of establishing asset lives are not appropriate for use in establishing economic lives for forward-looking cost models, the authors of the Hatfield 2.2.2 model used depreciation rates that are based upon physical life estimates previously prescribed by the Maryland PUC for Bell Atlantic.[127] The establishment of the Bell Atlantic asset lives occurred when the telecommunications industry was operating in the single-provider franchise environment, and when the FCC and state commissions were using traditional methods of prescribing asset lives. As discussed above, reliance on traditional life estimation techniques is not appropriate for establishing economic lives in a competitive environment. The "Model Description" of Hatfield 3 (at 54) however, implies that the economic lives used in version 3 are based on assumptions similar to those used in Hatfield 2.2.2.

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[127] Hatfield Model 2.2.2 Input Summary, at 1. *See* Attachment D for a comparison of the depreciation lives used in Hatfield 3, BCPM, and those recommended by GTE and Technology Futures Inc ("TFI").

Thus, the Hatfield 2.2.2 model's asset lives are much longer than they should be in a forward-looking cost model, and several of the lives used in Hatfield 3 are longer still. The longer lives used in the Hatfield 2.2.2 and Hatfield 3 models result in artificially low depreciation rates and consequently under estimated ILEC costs.

While the Hatfield sponsors claim that these prescribed depreciation lives are forward-looking, this cannot be reconciled with other evidence in this proceeding. In fact, it is clear that the depreciation lives currently in use have not been adequate to reflect the changes in the value of ILEC plant that have occurred in the past few years. Thus, they have not even been accurate as estimators of depreciation expense in the past. If this is true, they certainly cannot be reasonable for estimating depreciation expense going forward. If the current depreciation methods had accurately captured the economic depreciation of the ILEC's investment, then its current value on the books should be reasonably consistent with the cost of new equipment. In fact, GTE estimates a depreciation deficiency of $7.1 Billion.[128]

The claim by Hatfield sponsors that current depreciation rates have been adequate to capture changes in the value of ILEC plant is inconsistent with the output of the Hatfield model itself. Hatfield 3 estimates forward-looking costs that are roughly half, on average, of the current ILEC embedded cost. GTE certainly does not agree that the Hatfield 3 estimates are even remotely accurate. However, if they were, it simply could not be the case that the ILEC's assets are correctly valued, and that the

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[128] *See* n.37 *supra.*

ILEC network can be duplicated at half the cost. One or the other of these statements must be wrong. As it happens, both are wrong.[129]

The conclusion that current depreciation rates are lower than forward-looking ones is reinforced by comparing the depreciation rates use by the ILECs, and by Hatfield, with those used by other firms in the industry whose depreciation practices are not constrained by regulation. For example, it is illustrative to compare the lives proposed by AT&T in 1994 with those used in Hatfield 3.[130] The Hatfield lives are longer across the board: 70% longer for switches, 135% longer for underground copper cable, 79% longer for underground fiber cable. The *Recommended Decision* calls for estimation of the forward-looking cost for an "efficient entrant." Who is that, if not AT&T?

c. The correct method of deriving economic lives.

In deriving economic lives, at least two separate studies should be conducted. The first such study should include an evaluation of the criteria used to establish retirement lives of assets. The second study should include substitution analysis.

The first study that should be undertaken when deriving economic lives involves the consideration of factors that are used to establish an asset's retirement life. The

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[129] *See, SPR Study*, at 21-24, for an analysis of the depreciation shortfall that would be consistent with the cost estimates produced by Hatfield 2.2.2.

[130] *See* Attachment B, at 23. Note also that the Hatfield 3 lives are significantly longer than those in Hatfield 2.2.2. For additional comparisons to the depreciation practices of other firms, *see SPR Study*.

National Association of Regulatory Utility Commissioners ("NARUC") describe several factors that cause property to be retired.[131] These include:

1. Physical Factors
   a. Wear and tear
   b. Decay or deterioration
   c. Action of the elements and accidents

2. Functional Factors
   a. Inadequacy
   b. Obsolescence
   c. Changes in art and technology
   d. Changes in demand
   e. Requirements of Public Authorities
   f. Management discretion

3. Contingent factors
   a. Casualties or disasters
   b. Extraordinary obsolescence

While the NARUC factors have traditionally been used to establish the retirement or physical life expectancy of assets in the telecommunications industry, these same factors can be used to estimate an asset's economic life expectancy. GTE recommends the use of the NARUC factors as a guide for deriving economic lives of various assets, but only if proper weighting is allocated to those factors that reflect the significant role competition plays in determining an asset's economic life. Specifically, the "Functional Factors" (Part 2 of the NARUC factors) are sensitive to competition and technological change, and they warrant the application of substantially greater weight when using the NARUC criteria to establish economic lives.

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[131] *Public Utility Depreciation Practices*, National Association of Regulatory Utility Commissioners, 1996, at 15.

The second study that should be undertaken when deriving economic lives should include substitution analysis. Substitution analysis helps to estimate the effects that increased levels of competition and rapid technological changes have on an asset's economic life. Substitution analysis has been used by companies such as TFI to provide ranges of economic lives for ILEC assets in a competitive and technologically changing environment.

TFI studies provide quantitative forecasts for the adoption of new technology, primarily for switching equipment, outside plant, and circuit equipment. Through the use of tested modeling and forecasting tools, TFI projects that competition and technological change result in shorter asset economic lives than what has been historically observed.[132]

3. Operating expenses should be forecasted using statistical tools. (¶¶ 64-69)

As the *Staff Analysis* (at ¶ 65) notes and GTE's panelist Roger White explained at the Proxy Cost Model Workshop, both the expression of expenses as a factor multiplied by investment, or the expression of expenses as a dollar amount multiplied by the number of lines served, as used by Hatfield 2.2.2, is problematical. Neither investment nor the number of lines constitute the single driver of expenses; further the combination of the two is not adequate to explain some expenses because some expenses are a function of the number of customers or transactions involving

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[132] *Depreciation Lives for Telecommunications Equipment: Review and Update,* Larry K. Vanston and Ray L. Hodges, 1995, Technology Futures, Inc., at 33.

customers. Some expenses are also a function of the nature of a company's serving area.[133]

The activity-based approach discussed by the *Staff Analysis* (at ¶ 66) offers some promise but also has problems. Even in cases where an expense might reasonably be associated with an investment category, such as with digital switch maintenance, that relationship will shift over time as nominal prices for switches of identical capacity decline over time.[134] The factor approach might be salvaged in that case by estimating how the relationship has varied as prices have fallen in the past and then projecting it into the future. A more robust approach might be to relate some expenses to a physical unit of input, such as the number of switches, or the sheath-miles of cable. The per-line approach might be salvaged by taking the local operating company (not the holding company) size and time trends in the actual data into account.

GTE suggests that a better approach to estimating expenses on a forward-looking basis would be to apply generally accepted statistical forecasting methods. These expenses are generated by fairly regular underlying processes, which may

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[133] In the Proxy Cost Model Workshop panel discussion, Mr. White illustrated this point with his example contrasting one company serving 80,000 lines from a single switch and another company serving 80,000 lines from 80 1000-line switches. This is not unlike GTE's situation in much of the rural areas of the Midwest, where GTE North has hundreds of switches serving fewer than 1000 lines.

[134] For example, a digital switch might require one maintenance technician on site at all times, and for a wide range of line sizes. This requirement would be largely independent of the switch size or investment amount.

evolve over time, in response to changes in input prices or in technology, but that are unlikely to change on a discontinuous basis.[135]

When the Commission chose price cap regulation over rate of return regulation, it created a regulatory environment that required carriers to become more productive.[136] Implicit to an increase in productivity is the ability of an ILEC to lower expenses. In establishing the ILEC price cap formula, the Commission selected a productivity factor that it believed represented a "best estimate of potential annual productivity gain."[137] GTE supports the Commission's attempt to select a "best estimate" of the ILECs' achievable next-year's productivity.

In response to the FFNPRM in *D.94-1*,[138] GTE , recognizing that the essential problem is for the Commission to estimate, each year, what the productivity offset should be for the next year, proposed that this should be done using a standard time series forecasting model of a type well known and accepted by statisticians.[139] This proposal is now under consideration in the Commission's access reform proceeding.

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[135] *See* GTE's *D.96-262* Reply Comments, Attachment B, Affidavit of Gregory M. Duncan (February 14, 1997), for a discussion of the benefits of optimal forecasting methods.

[136] *See* Policy and Rules Concerning Rates for Dominant Carriers, Supplemental Notice of Proposed Rulemaking, CC Docket No. 87-313, 5 FCC Rcd at 2176, 2178-2179 (1990).

[137] *Id.* at 2186.

[138] Price Cap Performance Review for Local Exchange Carriers, Fourth Further Notice of Proposed Rulemaking ("FFNPRM"), 10 FCC Rcd 13659 (1995).

[139] Specifically, GTE has proposed the use of an ARIMA model for this purpose. *See* GTE's *D.94-1* Comments, Appendix D (December 18, 1995).

In the Commission's price cap proceedings, parties have repeatedly called on the Commission to adopt a new and sharply discontinuous increase in the productivity offset. They have justified these requests by pointing to various unexpected shocks that would supposedly explain a sudden change in the ILECs' productivity growth. The Commission has resisted these assertions, and has instead consistently sought to estimate future ILEC productivity gains solely on the basis of the productivity experience of the ILECs in the recent past.

In the Commission's recent Proxy Cost Model Workshop, Mr. Daniel Kelly, of Hatfield Associates, observed that there had been, in his opinion, a downward trend in ILEC expenses in recent years. He suggested that a "time trend" applied to ILEC expense data from recent years would suggest that ILEC expense would be lower than they are today.

GTE agrees that if the Commission wishes to estimate forward-looking ILEC expenses, it should base its estimate on actual data of the expenses ILECs have incurred. If the Commission wants a forward-looking estimate of what expenses will be next period, then it should forecast expenses, based on the ILEC expense data from the past. GTE proposes, as it did in the price cap proceeding, that this should be done using commonly accepted statistical forecasting methods. Again as in price caps, GTE suggests that the Commission need not attempt to establish an estimate that would remain valid for some long period of time. Instead, it should simply forecast one year ahead. This will minimize the amount of extrapolation required, and allow a more accurate forecast to be estimated. Once a method has been established, it is relatively

easy to update the forecast annually, incorporating an additional year of data into the data on which the previous forecast was based.

This approach is much sounder than simply comparing the unsupported claims submitted by the different parties as to what future expense will be. The Hatfield modelers assume without foundation that there will be large, discontinuous downward shifts in the level of expenses. In the case of investments, the simulation models are unreliable, for reasons explained in these comments. In the case of expenses, however, the models offer no basis for estimating how expenses will change in the future. Since this is essentially a forecasting problem, GTE submits that standard forecasting techniques should be applied. Since the Commission is interested in reliable, verifiable estimates, GTE suggests that a method based on real data and sound statistical methods is superior to unsupported speculation.

4. Cost models must account for all joint and common costs. (¶¶ 70-72)

The *Staff Analysis* (at ¶ 70) noted that, given the fact that ILECs incur joint and common costs in providing network elements, "setting prices for individual network elements based on forward-looking incremental costs alone would not recover the full forward-looking cost of the network." Even the *Local Competition Order* -- now stayed -- recognized that pricing of network elements must include a "reasonable allocation of forward-looking common costs." 47 C.F.R. § 51.505(a)(2). Accordingly, "If proxy models are used to estimate forward-looking economic costs, the question of joint and common costs must be addressed." *Staff Analysis* at ¶ 70.

In this portion of its comments, GTE discusses (a) the categories of costs that are properly considered joint and common costs; and (b) the calculation of those costs.

a. The categories of costs that are properly considered joint and common.

The *Staff Analysis* (at ¶ 70) notes correctly the two types of properly recoverable joint and common costs:

(1) common costs, which are costs incurred by the firm's operation as a whole; and

(2) shared costs, such as shared maintenance facilities, which the Staff said could be allocated to the elements that benefit from those facilities.

With minor exceptions set forth below, the costs in each of the following four groups of Uniform System of Accounting ("USOA") accounts must be included in the proxy model's calculation of joint and common costs:[140]

Account 21XX – General Support Costs
Account 61XX – Plant Specific Operations
Account 65XX – Plant Non-Specific Operations
Account 67XX – Corporate Operations Costs

As set forth below, the Hatfield proponents argue only that the *last* Account properly includes common costs.[141] They contend (without evidence) that the remaining costs either (a) can be reliably allocated to direct expenses, or (b) will not, in fact, be incurred. *Id.* Unless the differing treatment of these cost categories is understood, the

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[140] A category-by-category listing of the USOA accounts that GTE includes in its common costs is included as Attachment E.

[141] Testimony of Terry Murray, In re Petition of AT&T to Establish an Interconnection Agreement with GTE California, No. 96-08041, at 416-418.

consequence could be that all of the costs contained in the first three categories (which are well over half of GTE's common costs) might simply "fall through the cracks."

The costs in the last Account -- "Corporate Operations Costs" -- are incurred by the firm's operation as a whole. They include "Executive Planning" as well as "General and Administrative" costs. As noted above, it is generally agreed -- even by the proponents of the Hatfield 2.2.2 model -- that the type of costs incurred in these categories are properly recoverable as common costs.

While some of the costs in the other three USOA Accounts are incurred for the benefit of the firm's operation as a whole, others benefit only a limited number of network elements. *Importantly, however, none of these costs can be reliably attributed among the elements that they benefit.* Because these costs cannot be reliably attributed to the direct costs of any of the elements (and because these costs must be incurred to provide the elements) these costs must be treated as common costs.

Even the *Local Competition Order* notes (at ¶ 682) that common costs should be allocated to the direct costs of network elements *only to the extent possible*. *See also,* 47 C.F.R. § 51.505(a)(2) ("Forward-looking *common costs are economic costs* efficiently incurred in providing a group of elements or services . . . *that cannot be attributed directly to any individual elements or services.*") (emphasis added). Because the costs in each of the four cited USOA Accounts cannot be reliably attributed to the forward-looking incremental costs of the elements themselves, they must be identified as common costs. However, for reasons that are nowhere adequately explained, the Hatfield proponents do not include any of the costs in Accounts 21XX, 61XX, or 65XX in their calculation of joint and common costs, but instead vaguely state that they have

allocated some (but not all) of the costs among the direct costs of network elements. *Significantly, nowhere have the Hatfield proponents explained precisely how they allocate these costs among the elements.* How, for example, would one allocate the cost of motor vehicles (Acct. No. 2112), or furniture (Acct. No. 2122)? As is true in so many places *(see Staff Analysis*, at ¶ 72), the Hatfield proponents have failed to provide adequate explanation for this step.

In sum, even the Hatfield 2.2.2 model proponents agree that the costs within Account 67XX (and all of its subcategories) should be reflected as common costs in the pricing of network elements. The only real difference concerns Accounts 21XX, 61XX, and 65XX, which the Hatfield 2.2.2 model proponents say should be assigned to the direct costs of the elements themselves, rather than including them as common costs. Absent clear evidence of how and where the Hatfield proponents allocate those costs -- and of the principles behind those determinations -- the Hatfield approach should be rejected and all of the costs should be treated as joint and common.

b. The calculation of joint and common costs.

Even apart from the need to ensure that no categories of costs are omitted, a cost proxy model must accurately reflect the *amount* of costs assigned to each particular cost category.

As noted above, even the Hatfield proponents agree that Corporate Operations Costs (Account 67XX) are properly recoverable as common costs. Thus, it is agreed that certain executive and planning costs, human resources costs, legal expenses, and research and development expenses are properly considered common costs and should be recovered. As set forth below, however, the Hatfield proponents do not

agree with GTE regarding the *amount* of Corporate Operations Costs, nor have they put forth any numbers at all for the vast majority of costs in the other three Accounts.

In calculating the amount of ILEC joint and common costs, a proxy model should begin with actual ILEC data -- as reported through the ARMIS system -- with certain adjustments. Among the adjustments to be made are the following:

1. The adjustments should reflect the fact that minor portions of the costs ordinarily reflected in three USOA categories -- Nos. 2121 (buildings and land), 6124 (general purpose computers), and 6174 (information management) -- can be directly attributed to the direct costs of specific elements. Thus, the amount by which these categories are treated as joint and common costs must be reduced.

2. Slightly higher depreciation rates should be applied to the General Support Account categories (21XX) than were applied to the reported 1995 numbers.

3. Except when using a model for estimating universal service cost, an adjustment must be made to remove retail costs because those costs are not incurred when selling unbundled elements to CLECs (although other transaction costs will be incurred, and must be added).

The specific amount of these costs will vary from state to state. In most states, GTE's calculation of Account 67XX costs -- the only costs that the Hatfield proponents include as common costs -- ranges from 11-15% of GTE's revenues. The Hatfield proponents contend that this calculation should be an across-the-board 10%. This contention is a good example of the Staff's comment that "proxy models do not

currently offer adequate justification for their calculation of forward-looking joint and common costs." *Staff Analysis* at ¶ 72. In fact, the only support MCI has offered for its 10% figure is a verbal reference to a study allegedly showing that AT&T's corporate operations costs dropped from 13.2% to 10% following the onset of competition in the interexchange market.[142] But this reference is inadequate for several reasons, including the fact that the study has never been produced, and there is no evidence that cost savings allegedly achieved by AT&T some years ago are applicable to GTE today.

The Hatfield 2.2.2 modelers also reduced the amount of costs contained in at least some of the other three Accounts, although the precise amount of these reductions is nowhere revealed. For example, the Hatfield proponents have said that the Network Operations categories (USOA Categories 6532 - 6535) should be reduced by 30%.[143] The sole support offered for this reduction was, at first, data from a 1993 New Hampshire study. When tested on this assumption, the Hatfield proponents abandoned their reliance on this study (probably because the study is entirely silent on this point), and instead relied upon testimony of a Pacific Bell witness in a California proceeding. In fact, that testimony concluded that the Hatfield 2.2.2 model underestimates costs by as much as $1.3 billion.[144] Furthermore, the point of that testimony was that, in virtually every cost category, Hatfield estimates were significantly

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[142] Hatfield 3 applies a 10.4% factor, but with no evidentiary support whatsoever. *See* Hatfield Model Release 3.0, at 57, (February 7, 1997).

[143] Hatfield 2.2.2 model Input Summary at 3.

[144] *See* Testimony of R.L. Scholl, Dkt. Nos. R. 95-01-020, I. 95-01-021, Tr. at 11 (California Universal Service Proceeding, April 17, 1996).

lower than Pacific Bell's calculations. It was only through an anomalous difference in the way the two studies were structured that the Pacific Bell calculation for Network Operations were lower than Hatfield's. Beyond this selective and out-of-context reference, there is no empirical support for this 30% reduction. GTE's internal forecasting indicates that there will be no appreciable reduction in Network Operations, given the type of costs that this category includes, *e.g.*, engineering, testing and plant operations. Remarkably, Hatfield 3 reduces Network Operations still further -- by 50% -- but gives no support for this reduction.

Finally, regarding the remaining costs contained in Accounts 21XX, 61XX, and 65XX, the Hatfield proponents have failed to identify anywhere the amount of these costs. They contend that they have included these costs -- whatever their amount -- into the direct costs of the elements on an allocated basis. But because there is no way to determine the amount of these costs -- much less the manner in which they were allocated among network elements, as discussed above -- the Hatfield 2.2.2 and Hatfield 3 model approaches must be rejected.

In sum, a properly constructed proxy model must include as joint and common costs each of the costs included in USOA Accounts 21XX, 61XX, 65XX, and 67XX absent compelling evidence that (a) these costs will, in fact, not be incurred in the future, or (b) these costs can be reliably allocated to the direct costs of network elements. With the minor exceptions outlined above, all of the costs in these four Accounts will be incurred and cannot be reliably allocated to direct expenses, and thus these costs must be included in any proxy model's calculation of joint and common costs.

c. Data on actual ILEC expenses provide the most reliable basis for estimating forward-looking expenses.

In general, data on actual LEC expenses provide the most reliable basis for estimating forward-looking expenses. As explained *supra*, standard statistical techniques could be used to derive a forecast of expense levels in the next period. However, in the case of universal service, there is another reference point that is being established in the states, and which the Commission should consider as source of information.

Under Sections 251(c) and 252(d)(3) of the 1996 Act, terms are being set for the resale of bundled services provided by the ILECs, including basic local service. States are instructed to determine discount levels for the wholesale purchase of these services based on the retail costs the ILEC will actually avoid as a result of not providing the service to the end-user at the retail level. These would appear to be the same costs the ILEC would incur if it did sell the service to the end-user. At the Proxy Cost Model Workshop, many parties expressed concern that the costs and prices established in the universal service proceeding should be consistent with those established for resale of services and elements in the states. It is reasonable to ask, therefore, whether the amount of retail "customer care" costs (primarily customer services expenses and marketing) included in the estimated cost of universal service is consistent with the avoided costs for the same retail functions being established in the states.

Interestingly enough, the same parties who have argued for very large avoided cost discounts on resold basic local service have, as sponsors of the Hatfield model, proposed much smaller estimates of the cost of the same retail functions for inclusion in

the cost model.[145] Hatfield 2.2.2 includes only $1.25 per line for customer service expenses, and nothing for marketing. It would appear reasonable to say that the cost an ILEC saves by not having the end user is the same as the cost an ILEC incurs if it does have that end user. GTE suggests that a useful way to estimate the retail expenses associated with basic local service would be to use the percentage adopted in each state for that purpose. The other service costs, without retail expenses, could simply be grossed up using the retail discount to estimate the total cost of the service.[146]

CONCLUSION

The Commission should continue its efforts to carefully examine cost models with a view of eliminating as many input and methodological errors as possible. However, because cost models can never replicate the dynamic optimization process in which real-world firms engage, or reproduce a market-derived price level, the usefulness of estimates produced by cost models is extremely limited. The Commission must abandon its erroneous approach that would establish a price level equal to hypothetical cost of a mythical firm in a static world blessed with perfect hindsight. Instead, cost models should be used only to establish relative cost

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[145] It could be argued that states have used embedded cost evidence to determine the retail discount. However, experience in every telecommunications market demonstrates that retail expenses skyrocket when competition begins. This has certainly been the case in the long distance market. It is reasonable to expect, therefore, that the forward-looking retail expenses will be greater than the embedded retail expense.

[146] That is to say, the Commission could take the sum of other service costs, exclusive of the retail expenses, and divide that sum by one minus the retail discount percentage.

relationships, and the Commission should use those relationships in conjunction with actual ILEC costs in any price setting exercise.

Respectfully submitted,

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ATTACHMENT A

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ECONOMIC EVALUATION OF THE HATFIELD MODEL

February 16, 1997

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ECONOMIC EVALUATION OF THE HATFIELD MODEL

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Executive Summary

The Hatfield Model is an engineering model of cost developed by Hatfield Associates, Inc. of Boulder, Colorado. It was created at its inception for the purpose of estimating the size of forward-looking universal service support funds.[1] The most current version in the series of Hatfield Models, Release 3.0, is being promoted by AT&T and MCI as a model that accurately predicts the economic, forward-looking total element long run incremental cost (TELRIC), relevant for setting the prices of unbundled network elements or measuring the economic subsidy for universal service support. Prior to the introduction of the Hatfield Model Release 3.0 in the second week of February in 1997, the Hatfield Model Version 2.2 Release 2 had been promoted by the same sponsors. It is unclear whether AT&T and MCI will sponsor the new Release 3.0 in all of the upcoming state and federal proceedings.

After a thorough evaluation of the Hatfield Model Version 2.2 Release 2 we have determined that Version 2.2 Release 2 of the Hatfield Models is fundamentally flawed, and should *not* be used as the basis for setting prices for interconnection or unbundled network elements or for quantifying the subsidy of local exchange service to universal service. Our initial evaluation of the Hatfield Model Release 3.0 indicates that the model's latest round of adjustments falls far short of correcting any basic problems associated with Version 2.2, Release 2. In fact, none of the fundamental problems concerning the model's structural validity and outside verification have been remedied in any way. Many of the default input

[1] Hatfield Associates, Inc., *The Cost of Basic Universal Service*, prepared for MCI Telecommunications Corporation, July 1994.

assumptions have changed in the new version of the model, yet the new version produces results quite similar to those of the one it replaces. Among Incumbent Local Exchange Carrier data made available by Hatfield Associates to date, we have observed that the total network costs calculated by Release 3.0 for GTE companies are slightly higher by 2 and 4% in the state of Washington and California, respectively, and lower by 6% in Texas. Loop costs for those same companies rose in Washington and California rose by 10 and 14%, respectively, but decreased in the Texas by 1%. These results are based on the default input values of the respective versions.

In Section IV, we discuss the new Hatfield Model Release 3.0. All of our criticisms of the Hatfield Model Version 2.2, Release 2 apply to the latest version save for those applicable to a few input assumptions that have an insignificant effect on the structure and output of the model. For instance, the changes in inputs have done nothing to rectify Version 2.2, Release 2's most problematic approach of building networks from the ground up. It was also learned that changes in some of the default input assumptions collectively have negligible effect on the model's output. While a few questionable input assumptions from Version 2.2, Release 2 were replaced with more plausible values in Release 3.0, many other input assumptions have changed to become even more untenable. As sufficient time to examine every detail of the latest version of the model was not accorded, this paper focuses primarily on the Hatfield Model Version 2.2, Release 2 at this time. However, based on our understanding of the new release gained to date, we have concluded that all of our main criticisms of Version 2.2, Release 2 apply to Release 3.0 of the model as well.

The Hatfield Models are result driven and generate unrealistically low costs and rates. The Hatfield Model Version 2.2, Release 2's estimated rate for basic residential service is typically about one half of an Incumbent Local Exchange Carrier's (ILEC's) actual costs, and also lower by about the same amount relative to residential service rates estimated by other cost models. The Hatfield Model Release 3.0 estimates similar rates for GTE companies in the states of California, Texas, and Washington. At the Hatfield Models' estimated rates, no rational Alternative Local Exchange Carrier (ALEC) would even consider entering the market as a reseller of network services, even at very generous wholesale discount rates of 10-25 percent. Instead, market entrants would find it far more profitable to purchase all of the ILEC's unbundled elements and then repackage them for sale. In addition, facilities based market entry would be significantly discouraged.

For the remainder of this paper we refer to the Hatfield Model Release 3.0 as "Release 3.0" and the Hatfield Model Version 2.2, Release 2 as "Hatfield Model" or "Model". Unless otherwise noted our opinions on the Hatfield Model apply to the Release 3.0.

Particular shortcomings of the Hatfield Model fall into two major areas. First, the Model ignores market realities that a typical ILEC faces; it is completely independent of past ILEC investment decisions and simulates a network far different from the actual ILEC's network. Moreover, estimates of the Model have never been compared to actual observable data to see how well its predictions comport with reality.

Second, in addition to the lack of realism, the Hatfield Model fails to utilize sound economic methods to accomplish its purpose of predicting the cost of unbundled network